


5.3 & 5.4 Solving Triangles

Steps  
 1) Draw Triangle  
 2) Solve for all unknowns;  
 • 90 Degrees use SOH CAH TOA  
 • Non-Right Triangles - Matching Pair- Sine Law  
 - No Matching Pair- Cosine Law

i.e. Solve Triangle ABC, given A= 48 degrees, c = 15m and b = 12m



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 12^2 + 15^2 - 2(12)(15) \cos 48$$

$$a^2 = 144 + 225 - 360(0.6691)$$

$$a^2 = 369 - 240.9$$

$$\sqrt{a^2} = \sqrt{128.1}$$

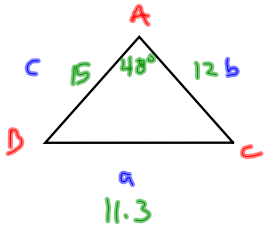
$$a = 11.3$$

Apr 9-8:17 AM

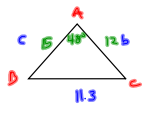
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Apr 9-8:17 AM



$$\frac{\sin A}{a} = \frac{\sin C}{c}$$

$$\frac{\sin 48}{11.3} = \frac{\sin C}{15}$$


$$11.3 \sin C = \sin 48 (15)$$

$$\sin C = \frac{\sin 48 (15)}{11.3}$$

$$\sin C = \frac{(0.7431)(15)}{11.3}$$

$$\sin C = 0.7892$$

$$C = \sin^{-1}(0.7892)$$

$$C = 52^\circ$$


$$\angle C = 180 - (48 + 52)$$

$$\angle C = 180 - (100)$$

$$\angle C = 80^\circ$$


(sum of int  $\Delta$ )

Apr 9-10:05 AM

p. 288 q. 8b,d, 9a,f  
 p. 300 q. 5, 8

Apr 9-10:12 AM

Sine Law A





$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin 48}{a} = \frac{\sin 42}{12}$$

$$a \sin 48 = 12 \sin 42$$

$$a = \frac{12 \sin 42}{\sin 48}$$

$$a = \frac{12(0.6691)}{0.7431}$$

$$a = 10.8$$



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 12^2 + 15^2 - 2(12)(15) \cos 48$$

$$a^2 = 144 + 225 - 360 \cos 48$$

$$a^2 = 369 - 360(0.6691)$$

$$a^2 = 369 - 240.9$$

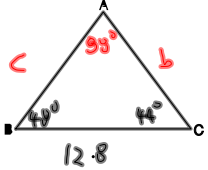
$$a^2 = 128.1$$

$$a = \sqrt{128.1}$$

$$a = 11.3$$

Apr 9-10:21 AM

Quinn is building a house and he needs to know information about the roof's design. The base of the roof is 12.8m wide and the rafters form angles of 48 degrees and 44 degrees to the horizontal. How long to the nearest tenth of a meter is each rafter?



$$180 - (48 + 44)$$

$$180 - (92)$$

$$88^\circ$$

(sum of int  $\Delta$ )

$$\frac{\sin 98^\circ}{12.8} = \frac{\sin 48^\circ}{b}$$

$$b = 9.6$$

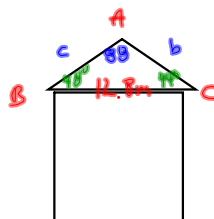
$$c = 9.9$$

Nov 16-10:02 AM

Quinn is building a house and he needs to know information about the roof's design. The base of the roof is 12.8m wide and the rafters form angles of 48 degrees and 44 degrees to the horizontal. How long to the nearest tenth of a meter is each rafter?

Nov 16-10:02 AM

Quinn is building a house and he needs to know information about the roof's design. The base of the roof is 12.8m wide and the rafters form angles of 48 degrees and 44 degrees to the horizontal. How long to the nearest tenth of a meter is each rafter?



$$\frac{\sin 88^\circ}{12.8} = \frac{\sin 48^\circ}{b}$$

Nov 16-10:02 AM